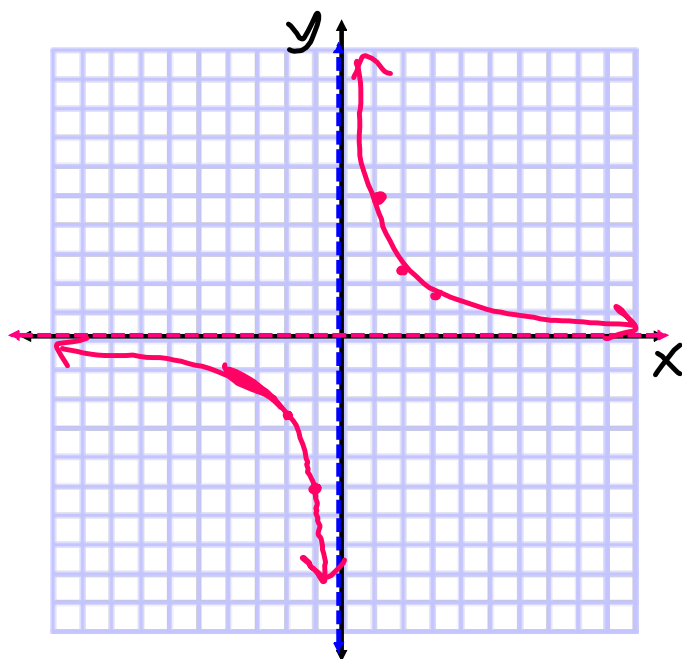


8.2 Part 2 Graphing a Rational Function

1. Find the vertical and horizontal asymptotes, if any.
Graph with dashed lines.
2. Find the x- and y-intercepts, if any.
Plot the points.
3. Use an x-y table to find additional points (3) on each side of the vertical asymptote(s). Plot the points.
4. Sketch the curves through the points.

Example: $y = \frac{5}{x}$



Holes: \emptyset

VA: $x = 0$

HA: $y = 0$

x-int: \emptyset

y-int: \emptyset

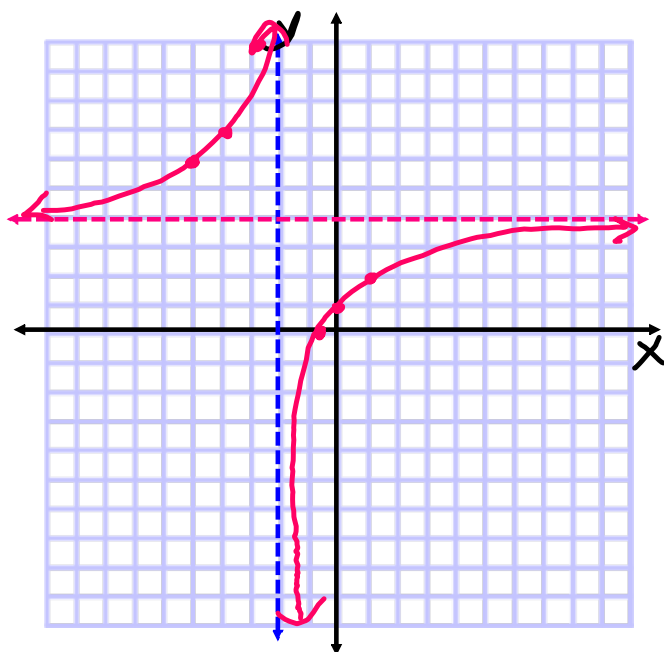
left of VA

x	y
-3	$-\frac{5}{3} = -1\frac{2}{3}$
-2	$-\frac{5}{2} = -2\frac{1}{2}$
-1	-5

right of VA

x	y
1	5
2	$\frac{5}{2} = 2\frac{1}{2}$
3	$\frac{5}{3} = 1\frac{2}{3}$

Example: $f(x) = \frac{4x+2}{x+2} = \frac{2(2x+1)}{x+2}$



Holes: \emptyset

VA: $x = -2$

HA: $y = 4$

x-int: $(-\frac{1}{2}, 0)$

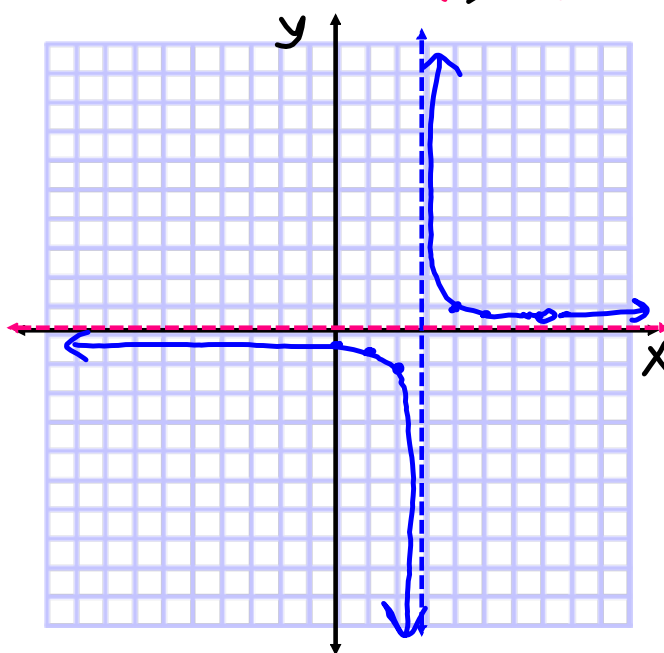
y-int: $(0, 1)$

x	y
-3	$\frac{-10}{-1} = 10$
-4	$\frac{-14}{-2} = 7$
-5	$\frac{-18}{-3} = 6$

x	y
1	$\frac{\frac{1}{2}}{\frac{1}{3}} = 2$

Example: $f(x) = \frac{x-7}{x^2-10x+21} = \frac{1}{x-3}$

$(x-7)(x-3)$



Hole: $(7, \frac{1}{4})$

VA: $x = 3$

HA: $y = 0$

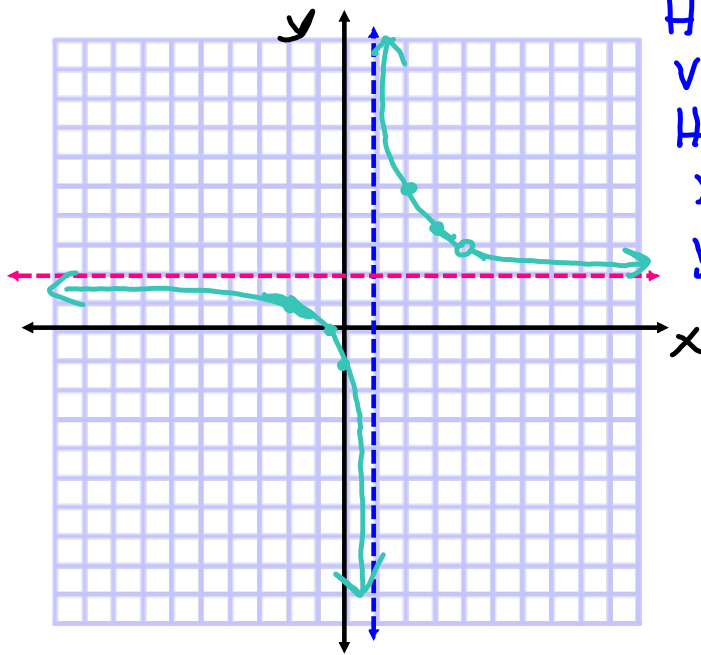
x-int: \emptyset

y-int: $(0, -\frac{1}{3})$

x	y
2	-1
1	$-\frac{1}{2}$

x	y
4	1
5	$\frac{1}{2}$

Example: $y = \frac{2x^2 - 7x - 4}{x^2 - 5x + 4} = \frac{(2x+1)(x-4)}{(x-1)(x-4)} = \frac{2x+1}{x-1}$



Hole: $(4, 3)$

VA: $x = 1$

HA: $y = 2$

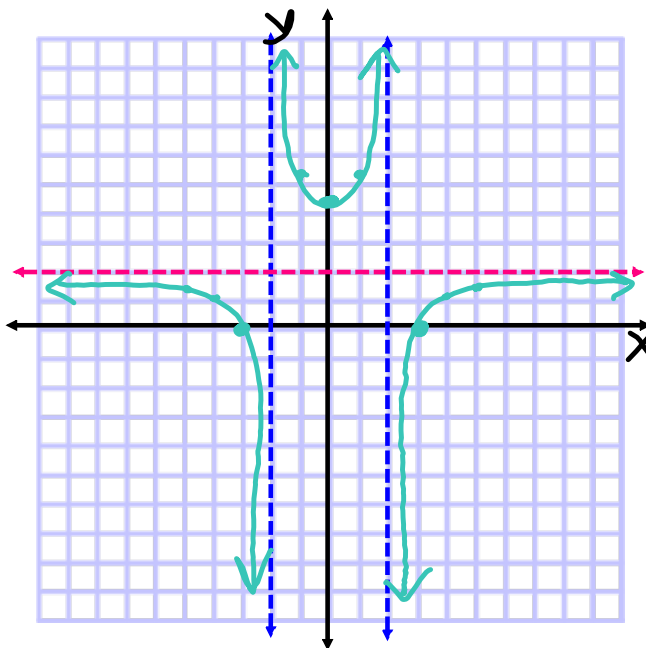
x-int: $(-\frac{1}{2}, 0)$

y-int: $(0, -1)$

$$\begin{array}{r|l} x & y \\ -2 & \frac{-3}{-3} = 1 \end{array}$$

$$\begin{array}{r|l} x & y \\ 2 & \frac{5}{1} = 5 \\ 3 & \frac{7}{2} = 3\frac{1}{2} \end{array}$$

Example: $y = \frac{2x^2 - 18}{x^2 - 4} = \frac{2(x-3)(x+3)}{(x-2)(x+2)}$



Holes: \emptyset

VA: $x = 2, x = -2$

HA: $y = 2$

x-int: $(3, 0), (-3, 0)$

y-int: $(0, \frac{9}{2})$

$$\begin{array}{r|l} x & y \\ -4 & \frac{14}{12} = \frac{7}{6} = 1\frac{1}{6} \\ -5 & \frac{32}{21} = 1\frac{11}{21} \end{array}$$

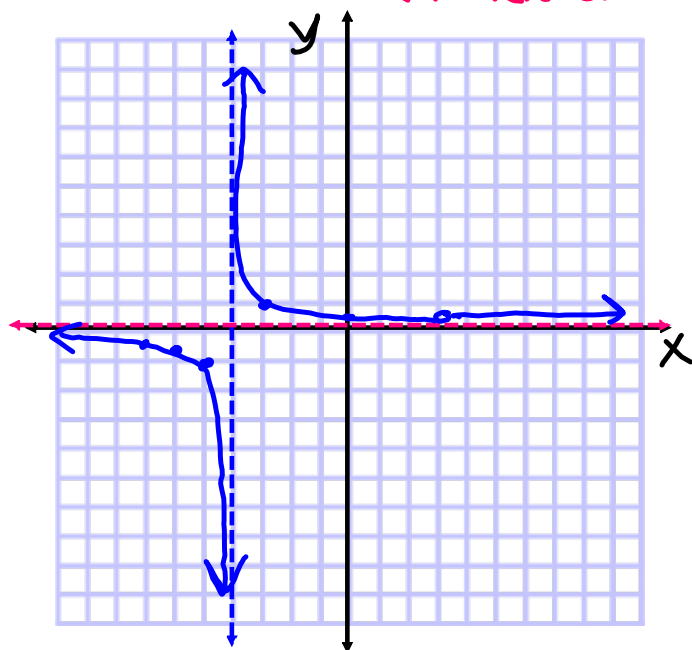
$$\begin{array}{r|l} x & y \\ -1 & \frac{-16}{-3} = \frac{16}{3} = 5\frac{1}{3} \\ 1 & \frac{16}{3} = \frac{16}{3} = 5\frac{1}{3} \end{array}$$

$$\begin{array}{r|l} x & y \\ 4 & \frac{14}{12} = \frac{7}{6} = 1\frac{1}{6} \end{array}$$

$$\begin{array}{r|l} 5 & \frac{32}{21} = 1\frac{11}{21} \end{array}$$

Example: $y = \frac{x-3}{x^2+x-12} = \frac{1}{x+4}$

(x+4)(x-3)



Hole: $(3, \frac{1}{7})$

VA: $x = -4$

HA: $y = 0$

x-int: \emptyset

y-int: $(0, \frac{1}{4})$

x	y
-5	-1
-6	$\frac{1}{2}$
-7	$-\frac{1}{3}$

x	y
-3	1

Attachments

Graph Rational Functions.doc